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cont. 1

35. The method of claim 23, wherein the carboxylic acid containing compound occupies the high energy adsorption sites of the activated carbon.--

REMARKS

Claims 1-28 are pending in the present application. Claims 3 and 12-14 have been cancelled. Claims 1 and 10 have been amended to particularly indicate the amount of carboxylic acid containing compound in the activated carbon composition. Claims 1, 10, and 17 have been amended to particularly indicate that when water passes through the activated carbon composition, the water experiences a pH deviation of less than 1 pH unit. Claims 7, 8, 20, 21, 26, and 27 have been amended to indicate that hydroxy carboxylic acid salts may be included. Claims 4-6, 9, 11, 15, 16, 18, 19, 22, 23, 25, and 28 have been amended to make minor changes in the wording of the claims. Claims 29-35 have been added to indicate where the carboxylic acid compound adsorbs onto the activated carbon and to indicate how the activated carbon composition of claim 1 may be prepared. The amendments are supported in the original claims and, for example, in paragraphs 0014, 0015, and 0021.

The Examiner has indicated that the claims are directed to two patently distinct inventions.

Group I - Claims 1-16, directed to an activated carbon composition; and

Group II - Claims 17-28, directed to a method of purifying an aqueous solution.

Applicants traverse the restriction requirement on the grounds that the restriction is unduly burdensome on Applicants, requiring the possible filing of a divisional application directed to the non-elected invention while, at the same time, presenting little, if any, burden to the Patent Office. As MPEP § 803 states, "[If the search and examination of an entire application can be made without serious burden, the examiner must examine it on the merits, even though it includes claims to distinct or independent inventions." Because the

present activated carbon composition and its use in purifying aqueous solutions could easily be part of a single search, Applicants assert that a search of both inventions would not place an undue burden on the Examiner, as a coextensive search, citing the same patents, has been conducted by the Examiner in corresponding International Application No. PCT/US01/45007 (hereinafter "the PCT application"). A copy of the International Search report, mailed May 17, 2002, and the Written Opinion, mailed November 22, 2002, in the PCT application are enclosed herewith. For the reasons stated above, Applicants request that the restriction requirement be withdrawn.

Applicants traverse the Examiner's restriction requirement as outlined above. Should the Examiner be unpersuaded by Applicants' arguments and maintain the requirement of an election of one invention, Applicants affirm the election of Group I, claims 1-16, with traverse. New claims 29-31 are also encompassed by this election of Group I, since they depend from claims initially included in the elected Group I.

Claims 6, 8, 9, and 12-15 stand rejected under 35 U.S.C. § 112, second paragraph for failing to particularly point out and distinctly claim the subject matter of the invention. Applicants have amended claims 6-9 and 15 and have cancelled claims 12-14 to address the Examiner's rejection. Therefore, the rejection of claims 6, 8, 9, and 15 under 35 U.S.C. § 112, second paragraph, should be withdrawn.

The present invention is directed to a non-ion exchanging activated carbon composition that includes an activated carbon and 0.01 to 5 percent by weight of a carboxylic acid containing compound based on the dry weight of activated carbon. Water passing through the present activated carbon experiences a pH deviation of less than 1 pH unit. The present non-ion exchanging activated carbon composition overcomes the problem of pH excursions during the start-up phase of activated carbon beds used to remove impurities from aqueous streams.

Claims 1, 2, 6-12, and 14 stand rejected under 35 U.S.C. § 102(a) as being anticipated by U.S. Patent No. 6,114,162 to Kashiba (hereinafter "Kashiba"). Claims 1, 7-12, and 14 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,348,755 to Roy (hereinafter "Roy"). Claims 1 and 9 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,437,797 to Helmig (hereinafter "Helmig"). Claims 1 and 7-9 stand rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,626,820 to Kinkead et al. (hereinafter "Kinkead").

Kashiba discloses an atmosphere regulator which includes 100 parts by weight of an oxygen absorber made up of an ascorbic acid compound, a metallic salt, water and an activated carbon, and 5 to 20 parts by weight of an alkaline earth metal hydroxide. The atmosphere regulator has a pH of 10 to 12.5. Anaerobic bacteria can be cultured by the use of the atmosphere regulator.

Roy discloses a method and adsorbent for increasing the life of edible oils. The method includes continuous treatment of edible oil with antioxidant impregnated activated carbon carried out at elevated temperatures.

Helmig discloses a process for removal of mercury from an aqueous effluent stream containing organic and inorganic mercury contaminants. The method includes removing solids from the effluent stream by filtration through one or more molecular sieve filters, adjusting the pH of the effluent stream to about 6 or below if it is above pH6, decolorizing the effluent stream with activated carbon impregnated with dithiocarbamic acid, and removing both organic and inorganic mercury compounds with a macroporous, cross-linked polystyrene chelating resin having polyisothiuronium functional groups.

Kinkead discloses a clean room and a chemical air filter that includes an air permeable, relatively thick web of non-woven fibrous carrier material of pleated form. The web includes a matrix formed of a large multiplicity of synthetic fibers and is characterized in

that activated carbon particles are distributed throughout the web and bound in the interstices of the matrix in a manner preventing loss to the air of particles in quantity. The activated carbon particles may be impregnated with a base.

None of Kashiba, Roy, Helmig, or Kinkead recognize the problem of pH excursions during the start-up phase of activated carbon beds used to remove impurities from aqueous streams. In fact, the method disclosed by Helmig required pH adjustment. Roy, Kinkead, and Kashiba do not even suggest the use of their activated carbon to treat aqueous streams, let alone the property of preventing pH excursions in water passing through the activated carbon. Further, none of the cited patents teach, disclose, or in any way suggest that the problem may be solved through the use of a non-ion exchanging activated carbon composition comprising an activated carbon and 0.01 to 5 percent by weight of a carboxylic acid containing compound based on the dry weight of activated carbon as in the present invention. Therefore, the amended claims are not anticipated by Roy, Helmig, Kinkead, or Kashiba, and the various rejections under 35 U.S.C. § 102(b) should be withdrawn.

Claims 3-5, 13, 15, and 16 stand rejected under 35 U.S.C. § 103(a) as being obvious over Kashiba or Roy. The Examiner indicates that the amount of carboxylic acid and water present in the composition, the duration of contact, and the drying time and temperature employed are not seen to materially affect the overall results of the reference system or produce any new or unexpected results and are obvious matters of choice.

The amended claims and the new claims indicate that the present activated carbon composition is non-ion exchanging. The activated carbon composition includes 0.01 to 5 percent by weight of a carboxylic acid containing compound based on the dry weight of activated carbon, occupying the high energy adsorption sites of the activated carbon. Water passing through the non-ion exchanging activated carbon experiences a pH deviation of less than 1 pH unit. None of these distinguishing parameters of the present non-ion exchanging

activated carbon composition are mentioned, taught, or in any way suggested by any one of or any combination of Kashiba or Roy. "Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching, suggestion or incentive supporting the combination." In re Napier, 55 F.3d 610, 613, 34 USPQ2d 1782, 1785 (Fed. Cir. 1996). "The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." In re Laskowski, 871 F.2d 115, 117, 10 USPQ2d 1397, 1399 (Fed. Cir. 1989).

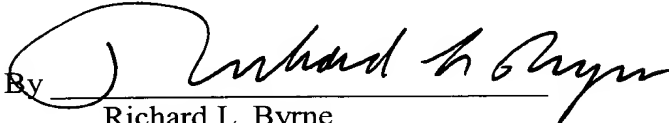
Because neither of Kashiba nor Roy, taken alone or in combination, would lead one skilled in the art to an activated carbon composition with the parameters of the present composition, the rejection of claims 3-5, 13, 15, and 16 under 35 U.S.C. § 103(a) should be withdrawn.

If the Examiner withdraws the restriction requirement as requested by Applicants, then the rejection of claims 17, 22, 23, and 28 as indicated in the Written Opinion in the PCT application as lacking novelty, i.e., anticipated by the Helmig patent, would most likely be applied by the Examiner. As noted above, in the process disclosed in the Helmig patent, pH adjustment is required and the present method of removing impurities from an aqueous system, where water passing through the activated carbon experiences a pH deviation of less than 1 pH unit, is not disclosed or suggested in any way. Therefore, as amended, claims 17-28 should not be rejected based on the Helmig patent

In view of the above amendments and remarks, reconsideration of the restriction requirement and rejections, and allowance of claims 1, 2, 4-11, and 15-35 are respectfully requested.

Respectfully submitted,

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Marked-Up Version of Claim 1, 4-6, 10, 11, 15, and 16

1. (Once Amended) A [An] non-ion exchanging activated carbon composition [comprised of] comprising an activated carbon and 0.01 to 5 percent by weight of a carboxylic acid containing compound based on the dry weight of activated carbon, wherein water passing through the activated carbon experiences a pH deviation of less than 1 pH unit.

4. (Once Amended) The activated carbon composition as claimed in claim [1] 2 wherein the [carboxylic acid containing compound is present in an amount of from 0.01 to 5 percent by weight and] water is present in an amount of from 20 to 60 percent by weight.

5. (Once Amended) The activated carbon composition as claimed in claim [1] 2 wherein the [carboxylic acid containing compound is present in an amount of from 0.01 to 5 percent by weight and] water is present in an amount of from [0] 0.1 to 20 percent by weight.

6. (Once Amended) The activated carbon composition as claimed in claim 1 wherein the activated carbon is derived from one or more selected from the group consisting of [coal, such as] bituminous coal; [,] anthracite; [and] lignite; wood; peat; coconut shells; and synthetic polymers.

7. (Once Amended) The activated carbon composition as claimed in claim 1 wherein the carboxylic acid containing compound is selected from [a] hydroxy carboxylic [acid] acids and their corresponding salts.

8. (Once Amended) The activated carbon composition as claimed in claim 7 wherein the hydroxy carboxylic [acid] acids and their corresponding salts [is] are one or more selected from the group consisting of citric acid, ascorbic acid, erythorbic acid, glycolic acid, lactic acid, salicylic acid, hydroxybutyric acid, hydroxyvaleric acid, and their corresponding ammonium, sodium, and potassium salts

9. (Once Amended) The activated carbon composition as claimed in claim 1 wherein the carboxylic acid containing compound is one or more carboxylic acid containing compounds [useful as one or more] selected from the group consisting of sequestering agents, buffers, base neutralizers, antioxidants, and reducing agents.

10. (Once Amended) A method [for] of preparing an activated carbon composition comprising the step of immersing an activated carbon in an aqueous solution of a carboxylic acid containing compound, wherein the activated carbon composition comprises an activated carbon and 0.01 to 5 percent by weight of the carboxylic acid containing compound based on the dry weight of activated carbon, such that water passing through the activated carbon experiences a pH deviation of less than 1 pH unit.

11. (Once Amended) The method [for] of preparing an activated carbon composition of claim 10 wherein the carboxylic acid containing compound is adsorbed onto the surface of the activated carbon.

15. (Once Amended) The method [for] of preparing an activated carbon composition of claim [14] 10 wherein the activated carbon is immersed for from 0.5 to 48 hours.

16. (Once Amended) The method [for] of preparing an activated carbon composition of claim 10 further comprising the step of drying the activated carbon composition at from 20 to 250°C for from 0.5 minutes to 12 hours.

17. (Once Amended) A method [for purifying] of removing impurities from an aqueous [solutions] system comprising [the step of contacting]:

a) providing an activated carbon composition comprising a carboxylic acid material adsorbed onto the surface of an activated carbon; and

b) passing an aqueous [solution with an] stream through the activated carbon composition [comprised of an activated carbon and a carboxylic acid containing compound], wherein the pH of the aqueous stream deviates less than 1 pH unit after passing through the activated carbon composition.

18. (Once Amended) The method [for purifying] of removing impurities from an aqueous [solutions] system of claim 17 wherein the carboxylic acid containing compound is present in the activated carbon composition in an amount of from 0.01 to 5 percent by weight based on the dry weight of activated carbon.

19. (Once Amended) The method [for purifying] of removing impurities from an aqueous [solutions] system of claim 17 wherein the activated carbon is derived from one or more selected from the group consisting of [coal, such as] bituminous coal; [,] anthracite; [and] lignite; wood; peat; coconut shells; and synthetic polymers.

20. (Once Amended) The method [for purifying] of removing impurities from an aqueous [solutions] system of claim 17 wherein the carboxylic acid containing compound is selected from [a] hydroxy carboxylic [acid] acids and their corresponding salts.

21. (Once Amended) The method [for purifying] of removing impurities from an aqueous [solutions] system of claim 20 wherein the hydroxy carboxylic [acid] acids and their corresponding salts [is] are one or more selected from the group consisting of citric acid, ascorbic acid, erythorbic acid, glycolic acid, lactic acid, salicylic acid, hydroxybutyric acid, hydroxyvaleric acid, and their corresponding ammonium, sodium and potassium salts.

22. (Once Amended) The method [for purifying] of removing impurities from an aqueous [solutions] system of claim 17 wherein the carboxylic acid containing compound is one or more carboxylic acid containing compounds [useful as one or more] selected from the group consisting of sequestering agents, buffers, base neutralizers, antioxidants, and reducing agents.

23. (Once Amended) A method [for purifying] of removing impurities from an aqueous [solutions] system comprising the steps of:

providing a bed of an activated carbon composition comprised of an activated carbon and a carboxylic acid containing compound; and

passing the aqueous solution through the bed of the activated carbon composition such that there is a flow of an aqueous solution to be purified into the bed and a flow of purified aqueous solution from the bed .

25. (Once Amended) The [activated carbon composition] method as claimed in claim 23 wherein the carboxylic acid containing compound is adsorbed onto the surface of the activated carbon and is present in an amount of from 0.01 to 5 percent by weight based on the dry weight of activated carbon.

26. (Once Amended) The [activated carbon composition] method as claimed in claim 23 wherein the carboxylic acid containing compound is selected from [a] hydroxy carboxylic [acid] acids and their corresponding salts.

27. (Once Amended) The [activated carbon composition] method as claimed in claim 26 wherein the hydroxy carboxylic [acid] acids and their corresponding salts [is] are one or more selected from the group consisting of citric acid, ascorbic acid, erythorbic acid, glycolic acid, lactic acid, salicylic acid, hydroxybutyric acid, hydroxyvaleric acid, and their corresponding ammonium, sodium and potassium salts.

28. (Once Amended) The [activated carbon composition] method as claimed in claim 23 wherein the carboxylic acid containing compound is one or more carboxylic acid containing compounds [useful as one or more] selected from the group consisting of sequestering agents, buffers, base neutralizers, antioxidants, and reducing agents.